

REMARKS

The claims have been amended to place them in a format more customary to US patent practice. Support for the amendments to claim 1 can be found, for example, in original claim 4 and on page 12 lines 7-8 of the specification. Support for the amendment to claim 3 can be found, for example, on page 11 of the specification.

Support for new claim 12 can be found, for example, on page 8, line 10 of the specification. Support for new claim 13 can be found, for example, on page 10, line 4 of the specification. Support for new claims 14-15 can be found, for example, page 12, lines 6-14. Support for new claim 16 can be found, for example, page 13, lines 1-6. Support for new claim 17 can be found, for example, page 13, line 16. Support for new claim 18 can be found, for example, on page 5, lines 1-20. Support for new claim 19 can be found, for example, on page 8, lines 5-10. Support for new claim 20 can be found, for example, on page 12, line 30. No new matter has been added.

Rejections under 35 USC 102

The rejection is moot in light of amendments to claim 1. Thus, it is respectfully requested that the rejection under 35 USC 102 be withdrawn.

Rejections under 35 USC 103

Claims 3-11 stand rejected under 35 USC 103 as allegedly being unpatentable over Park (US 6,525,313) in View of Lubda et al. (US 2003/0155676).

Park teaches a spray needle for use in electrospray ionization (ESI) for mass spectrometry. Park's needle has an opening along its length such that a sample solution may be more readily introduced or loaded therein. The needle of Park does not act to separate sample components. It is not a capillary but a needle that is used conventionally i.e., to introduce a sample that has already been eluted from a chromatography column into a mass spectrometer.

In contrast to Park, the capillary of the present invention acts as both a chromatographic column and a spray needle.

Lubda et al. (US 2003/0155676) does not cure the deficiencies of Park. Lubda teaches chromatography columns or capillaries containing sorbents of monolithic mouldings. Lubda is silent regarding a capillary sheathed with metal foil that may be used as a spray needle.

There is no teaching or suggestion in either Park or Lubda to fill a capillary with a monolithic sorbent having macropores with a mean diameter of greater than 0.1 μm . The references are particularly silent with regards to a capillary that is sheathed with metal foil on at least at one end. A skilled worker would not simply have expected that filling a conventional needle, which does not support separation of components, such as the needle of Park, with a sorbent would be successful. The skilled worker would expect that this would have a detrimental effect the spray efficiency.

There is no hint in the prior art of the numerous unexpected advantage of the present invention. As noted in the specification on page 12, the capillary of the present invention results in a particularly stable, uniform and fine electrospray. Further advantages of the present invention are noted on page 17, lines 10-20. Since the spray is produced directly from the separating capillary, no additional dead spaces are formed by attached spray needles. No electrode redox processes take place in the capillary. Additionally, the field strength at the end of the capillary (ESI tip) is constant and no dilution with sheath liquid takes place. Very low flow rates can be used, enabling smaller droplets to form and in addition the capillary end to be brought closer to the MS instrument orifice. Thus, the ionisation efficiency and the ion-sampling rate are significantly increased. The numerous advantage of the capillary of the present invention are simple not recognized by the prior art.

Thus, it is respectfully requested that the rejections under 35 USC 102 and 103 be withdrawn.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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